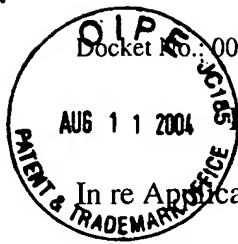


IFW



Docket No. 006365 USA/MTCG/PCTRL

PATENT/OFFICIAL

AUG 11 2004 IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of

Yuri KOKOTOV et al.

Serial No. 10/712,273

Filed: November 14, 2003

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: Group Art Unit:
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: Examiner:

For: METHOD, SYSTEM AND MEDIUM FOR CONTROLLING MANUFACTURE
PROCESS HAVING MULTIVARIATE INPUT PARAMETERS

SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT

Honorable Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

In accordance with the provisions of 37 C.F.R. 1.56, 1.97 and 1.98, the attention of the Patent and Trademark Office is hereby directed to the documents listed on the attached form PTO-1449. It is respectfully requested that the documents be expressly considered during the prosecution of this application, and that the documents be made of record therein and appear among the "References Cited" on any patent to issue therefrom. Copies of any cited U.S. Patents and U.S. Patent Publications are not being submitted in accordance with 37 CFR 1.98(a)(2)(i).

This Information Disclosure Statement is being filed within three months of the U.S. filing date OR before the mailing date of a first Office Action on the merits. No certification or fee is required.

In accordance with 37 C.F.R. § 1.97(g) and (h), the filing of this IDS should not be construed as a representation that a search had been made or that information cited is, or is considered to be, material to patentability as defined in 37 C.F.R. § 1.56 (b), or that any cited document listed or attached is (or constitutes) prior art. Unless otherwise indicated, the date of

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publication indicated for an item is taken from the face of the item, and Applicant reserves the right to prove that the date of publication is in fact different.

No fee is believed to be required; however, the Commissioner is authorized to charge any deficiency in any fees pursuant to 37 CFR § 1.17 associated with this communication and to credit any excess payment to Deposit Account No. 08-0219.

Respectfully submitted,

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Date: _____

8/11/04

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| INFORMATION DISCLOSURE CITATION IN AN APPLICATION (PTO-1449) | | | | ATTY. DOCKET NO. 006365 USA/ MTCG/PCTRL | | SERIAL NO. 10/712,273 | |
|  | | | | APPLICANT Yuri KOKOTOV et al. | | | |
| | | | | FILING DATE November 14, 2003 | | GROUP | |
| U.S. PATENT DOCUMENTS | | | | | | | |
| EXAMINER'S INITIALS | PATENT NO. | DATE | NAME | CLASS | SUBCLASS | FILING DATE | |
| | 4,957,605 | 09/18/90 | Hurwitt et al. | | | 04/17/89 | |
| | 5,240,552 | 08/31/93 | Yu et al. | | | 12/11/91 | |
| | 5,369,544 | 11/29/94 | Mastrangelo | | | 04/05/93 | |
| | 5,444,837 | 08/22/95 | Bomans et al. | | | 12/29/93 | |
| | 5,665,214 | 09/09/97 | Iturralde | | | 05/03/95 | |
| | 5,695,810 | 12/09/97 | Dubin et al. | | | 11/20/96 | |
| | 5,824,599 | 10/20/98 | Schacham-Diamand et al. | | | 01/16/96 | |
| | 5,825,356 | 10/20/98 | Habib et al. | | | 03/18/96 | |
| | 5,831,851 | 11/03/98 | Eastburn et al. | | | 03/21/95 | |
| | 5,838,951 | 11/17/98 | Song | | | 08/28/96 | |
| | 5,859,777 | 01/12/99 | Yokoyama et al. | | | 05/13/97 | |
| | 5,871,805 | 02/16/99 | Lemelson | | | 04/08/96 | |
| | 5,943,550 | 08/24/99 | Fulford, Jr. et al. | | | 03/29/96 | |
| | 6,012,048 | 01/04/00 | Gustin et al. | | | 05/30/97 | |
| | 6,037,664 | 03/14/00 | Zhao et al. | | | 03/31/98 | |
| | 6,059,636 | 05/09/00 | Inaba et al. | | | 07/09/98 | |
| | 6,096,649 | 08/01/00 | Jang | | | 10/25/99 | |
| | 6,100,195 | 08/08/00 | Chan et al. | | | 12/28/98 | |
| | 6,114,238 | 09/05/00 | Liao | | | 05/20/98 | |
| | 6,150,270 | 11/21/00 | Matsuda et al. | | | 01/07/99 | |
| | 6,157,864 | 12/05/00 | Schwenke et al. | | | 05/08/98 | |
| | 6,181,013 B1 | 01/30/01 | Liu et al. | | | 03/13/00 | |
| | 6,212,961 B1 | 04/10/01 | Dvir | | | 02/11/99 | |
| | 6,226,563 B1 | 05/01/01 | Lim | | | 09/04/98 | |
| | 6,228,280 B1 | 05/08/01 | Li et al. | | | 05/06/98 | |
| | 6,237,050 B1 | 05/22/01 | Kim et al. | | | 09/04/98 | |
| | 2001/0006873 A1 | 07/05/01 | Moore | | | 02/13/01 | |
| | 6,259,160 B1 | 07/10/01 | Lopatin et al. | | | 04/21/99 | |
| | 6,281,127 B1 | 08/28/01 | Shue | | | 04/15/99 | |
| EXAMINER | | | | DATE CONSIDERED | | | |

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; draw line through citation if not in conformance and not considered. Include copy of this form with next communication to Applicant.

| INFORMATION DISCLOSURE CITATION IN AN APPLICATION (PTO-1449) | | | | ATTY. DOCKET NO. 006365 USA/ MTCG/PCTRL | | SERIAL NO. 10/712,273 | |
|---|-----------------|----------|------------------------|---|----------|--------------------------|--|
| | | | | APPLICANT Yuri KOKOTOV et al. | | | |
| | | | | FILING DATE November 14, 2003 | | GROUP | |
| U.S. PATENT DOCUMENTS | | | | | | | |
| EXAMINER'S INITIALS | PATENT NO. | DATE | NAME | CLASS | SUBCLASS | FILING DATE | |
| | 6,317,643 B1 | 11/13/01 | Dmochowski | | | 03/31/99 | |
| | 6,339,727 B1 | 01/15/02 | Ladd | | | 12/21/98 | |
| | 6,355,559 B1 | 03/12/02 | Havemann et al. | | | 11/03/00 | |
| | 6,391,780 B1 | 05/21/02 | Shih et al. | | | 08/23/99 | |
| | 6,417,014 B1 | 07/09/02 | Lam et al. | | | 10/19/99 | |
| | 6,427,093 B1 | 07/30/02 | Toprac | | | 10/07/99 | |
| | 6,432,728 B1 | 08/13/02 | Tai et al. | | | 10/16/00 | |
| | 6,449,524 B1 | 09/10/02 | Miller et al. | | | 01/04/00 | |
| | 6,455,415 B1 | 09/24/02 | Lopatin et al. | | | 04/16/01 | |
| | 2002/0165636 A1 | 11/07/02 | Hasan | | | 04/24/02 | |
| | 6,484,064 B1 | 11/19/02 | Campbell | | | 10/05/99 | |
| | 6,495,452 B1 | 12/17/02 | Shih | | | 08/18/99 | |
| | 2002/0193899 A1 | 12/19/02 | Shanmugasundram et al. | | | 05/01/02 | |
| | 2003/0017256 A1 | 01/23/03 | Shimane | | | 06/12/02 | |
| | 6,515,368 B1 | 02/04/03 | Lopatin et al. | | | 12/07/01 | |
| | 6,517,414 B1 | 02/11/03 | Tobin et al. | | | 03/10/00 | |
| | 6,528,409 B1 | 03/04/03 | Lopatin et al. | | | 04/29/02 | |
| | 6,537,912 B1 | 03/25/03 | Agarwal | | | 08/25/00 | |
| | 6,580,958 B1 | 06/17/03 | Takano | | | 11/22/99 | |
| | 6,605,549 B2 | 08/12/03 | Leu et al. | | | 09/29/01 | |
| | 6,607,976 B2 | 08/19/03 | Chen et al. | | | 09/25/01 | |
| | 6,609,946 B1 | 08/26/03 | Tran | | | 07/14/00 | |
| | 6,616,513 B1 | 09/09/03 | Osterheld | | | 04/05/01 | |
| | 6,624,075 B1 | 09/23/03 | Lopatin et al. | | | 11/05/02 | |
| | 6,630,741 B1 | 10/07/03 | Lopatin et al. | | | 12/07/01 | |
| | 6,660,633 B1 | 12/09/03 | Lopatin et al. | | | 02/26/02 | |
| | 6,708,074 B1 | 03/16/04 | Chi et al. | | | 08/11/00 | |
| | 6,708,075 B2 | 03/16/04 | Sonderman et al. | | | 11/16/01 | |
| | 6,728,587 B2 | 04/27/04 | Goldman et al. | | | 12/27/00 | |
| EXAMINER | | | | DATE CONSIDERED | | | |

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; draw line through citation if not in conformance and not considered. Include copy of this form with next communication to Applicant.

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|---|---|----------|---------|--|----------|--------------------------|----|
| | | | | APPLICANT Yuri KOKOTOV et al. | | | |
| | | | | FILING DATE November 14, 2003 | | GROUP | |
| FOREIGN PATENT DOCUMENTS | | | | | | | |
| EXAMINER'S INITIALS | PATENT NO. | DATE | COUNTRY | CLASS | SUBCLASS | Translation | |
| | | | | | | Yes | No |
| | EP 0 932 195 A1 | 07/28/99 | EP | | | X | |
| | EP 1 083 470 A2 | 03/14/01 | EP | | | X | |
| | GB 2 365 215 A | 02/13/02 | GB | | | X | |
| OTHER ART (Including Author, Title, Date, Pertinent Pages, Etc.) | | | | | | | |
| | Sun, S.C. 1998. "CVD and PVD Transition Metal Nitrides as Diffusion Barriers for Cu Metallization." <i>IEEE</i> . pp. 243-246. | | | | | | |
| | Tagami, M., A. Furuya, T. Onodera, and Y. Hayashi. 1999. "Layered Ta-nitrides (LTN) Barrier Film by Power Swing Sputtering (PSS) Technique for MOCVD-Cu Damascene Interconnects." <i>IEEE</i> . pp. 635-638. | | | | | | |
| | Yamagishi, H., Z. Tokei, G.P. Beyer, R. Donaton, H. Bender, T. Nogami, and K. Maex. 2000. "TEM/SEM Investigation and Electrical Evaluation of a Bottomless I-PVD TA(N) Barrier in Dual Damascene" (Abstract). <i>Advanced Metallization Conference 2000</i> . San Diego, CA. | | | | | | |
| | Eisenbraun, Eric, Oscar van der Straten, Yu Zhu, Katharine Dovidenko, and Alain Kaloyeros. 2001. "Atomic Layer Deposition (ALD) of Tantalum-Based Materials for Zero Thickness Copper Barrier Applications" (Abstract). <i>IEEE</i> . pp. 207-209. | | | | | | |
| | Smith, S.R., K.E. Elers, T. Jacobs, V. Blaschke, and K. Pfeifer. 2001. "Physical and Electrical Characterization of ALD Tin Used as a Copper Diffusion Barrier in 0.25 mum, Dual Damascene Backend Structures" (Abstract). <i>Advanced Metallization Conference 2001</i> . Montreal, Quebec. | | | | | | |
| | Kim, Y.T. and H. Sim. 2002. "Characteristics of Pulse Plasma Enhanced Atomic Layer Deposition of Tungsten Nitride Diffusion Barrier for Copper Interconnect" (Abstract). <i>IEIC Technical Report</i> . Vol. 102, No. 178, pp. 115-118. | | | | | | |
| | Elers, Kai-Erik, Ville Saanila, Pekka J. Soininen, Wei-Min Li, Juhana T. Kostamo, Suvi Haukka, Jyrki Juhanoja, and Wim F.A. Besling. 2002. "Diffusion Barrier Deposition on a Copper Surface by Atomic Layer Deposition" (Abstract). <i>Advanced Materials</i> . Vol. 14, No. 13-14, pp. 149-153. | | | | | | |
| | Peng, C.H., C.H. Hsieh, C.L. Huang, J.C. Lin, M.H. Tsai, M.W. Lin, C.L. Chang, Winston S. Shue, and M.S. Liang. 2002. "A 90nm Generation Copper Dual Damascene Technology with ALD TaN Barrier." <i>IEEE</i> . pp. 603-606. | | | | | | |
| | Van der Straten, O., Y. Zhu, E. Eisenbraun, and A. Kaloyeros. 2002. "Thermal and Electrical Barrier Performance Testing of Ultrathin Atomic Layer Deposition Tantalum-Based Materials for Nanoscale Copper Metallization." <i>IEEE</i> . pp. 188-190. | | | | | | |
| | Wu, Z.C., Y.C. Lu, C.C. Chiang, M.C. Chen, B.T. Chen, G.J. Wang, Y.T. Chen, J.L. Huang, S.M. Jang, and M.S. Liang. 2002. "Advanced Metal Barrier Free Cu Damascene Interconnects with PECVD Silicon Carbide Barriers for 90/65-nm BEOL Technology." <i>IEEE</i> . pp. 595-598. | | | | | | |
| | July 25, 2003. International Search Report for PCT/US02/24858. | | | | | | |
| | March 30, 2004. Written Opinion for PCT/US02/19062. | | | | | | |
| | April 9, 2004. Written Opinion for PCT/US02/19116. | | | | | | |
| | April 22, 2004. Office Action for U.S. Serial No. 09/998,372, filed November 30, 2001. | | | | | | |
| EXAMINER | | | | DATE CONSIDERED | | | |

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